ECON 427: MIDTERM EXAM

Chart, scatter chart

Description automatically generated

Figure 1.1

1. The decomposition of this time-series is additive. Over the years, there seems to be constant seasonal variation which makes the magnitude of the time series steady over time. Also, because of this property it seems like the graph is variance stationary. There is no irregular trend/(s) visible in this data, but it is in an upward direction which depicts that over the years, employment has increased. We should use additive decomposition on Figure 1.1 to smooth it out and look at the aggregate data over time.

Chart, box and whisker chart

Description automatically generated

Figure 3.1

The median employment is typically the highest in the months of November and December. In June, the median employment is almost equal to those months but not exactly the same.

Chart

Description automatically generated

Figure 4.1

Figure 4.1 shows the autocorrelation of the median employment series. In this series more than 5% of the data resides outside the dotted lines, which suggests there a strong autocorrelation present. The trend shows that there is a slow decay over time and there are no significant spikes at lags 0.5, 1.0, and 1.5 so there is no seasonal variation present in this model. We would reject the null hypothesis and state that there is a strong autocorrelation in the given model.

Chart, line chart

Description automatically generated

Figure 5.1

Chart, scatter chart

Description automatically generated

Figure 6.1a

* 1. R chose following numbers for alpha, beta, and gamma:-

Alpha – 0.6819081

Beta – 0.06711194

Gamma – 0.7929489

Chart, scatter chart

Description automatically generated

Figure 6.1c

* 1. My forecast in Figure 6.1c was quite different than the actual data. Employment was affected a lot during the year 2019-2020 due to COVID which affected a lot of other economic factors, but there was no previous data for us to predict such a huge change in employment, so the predictions was that employment is going to increase in coming years but looking at the actual data it dropped down on the same level as it was around 2010.